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ABSTRACT

In an attempt to study the role of pictures in connection with the perception of information via television, the pictorial accompaniment to some news items in a simulated television news program was systematically varied. The retention of the verbal message and the perception of the news items were measured for the different illustrations. It was found that the choice of illustration accompanying the investigated news items influenced not only how much the subjects retained of the verbal message, but also what was remembered of the message. In addition, the choice of illustration influenced the perception of the news item. The news stories which most subjects could recall were those illustrated by pictures that corresponded to the verbal information. Least remembered were those which had items read by the studio reporter on the screen and those items that consisted of sound only. A news item illustrated by moving pictures was considered more interesting and more informative than one illustrated with a still picture. No difference in retention was noticed between moving and still picture presentation modes. Finally, there was a correlation between age, sex, and education, and how much the respondents remembered of the news program. (Author/JY)

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THE EFFECT OF VISUAL ILLUSTRATIONS UPON PERCEPTION AND RETENTION OF NEWS PROGRAMMES.

Olle Findahl

E 009 218

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ABSTRACT

A project group ¹⁾ within the Audience and Programme Research Department of Sveriges Radio has started a research project to study "man as receiver of information". This report shows the results of an initial investigation which deals with the role of pictures in connection with the perception of information via TV.

The pictorial accompaniment to some news items in a simulated TV news programme was systematically varied. The retention of the verbal message and the perception of the news items were measured for the different illustrations.

The choice of illustration accompanying the investigated news items in the news programme influence not only how much the respondents retained of the verbal message but also what was remembered of the message. In addition the choice of illustration influenced the perception of the news items.

The news stories which most respondents could recall were those illustrated by pictures which corresponded to the verbal information. Least remembered were those which had the items read by the studio reporter on the screen, and those items which consisted of sound only.

Best remembered was that part of the item which the picture illustrated or which had an accompanying text. One news item was illustrated by moving pictures and was perceived more positive than when it was illustrated by still visual. On the other hand no difference of retention was noticed due to the movement of the picture.

Finally there was a correlation between sex, age and education, and how much the respondents remembered of the news programme.

In order to make the report more readable, it has been published in an abridged form. A detailed description of the experimental methods and the analysis of the data obtained are therefore not reported here.

For further information please contact the Audience and Programme Research Department of Sveriges Radio (SR/PUB).

- 1) Hans Bonnevier, Olle Findahl, Göte Hansson, Birgitta Höijer, Björn Höijer.

INTRODUCTION

What is the importance of picture-sound interaction for the transmission of information by TV? What function has the illustration? Has the choice of illustration any effect on retention and perception of a message? These are some of the questions which we wanted to study in this investigation.¹⁾

We know that man's ability to perceive and retain is limited. This is true least for the electronic media where the message is presented only once and where it is impossible to obtain repetition of the message which we missed. Very often we remember only parts of the programmes we have seen. Some items are remembered quite clearly while other pass by without leaving any trace. Perhaps parts of the programme are misunderstood, and that which is best retained may be some unimportant details.

These situations are partly caused by man's limited ability to perceive and process information, and partly by the way in which information is presented. To facilitate perception, programme presentation has to be adapted to man. Increased knowledge of what facilitates information transmission or what renders it difficult - is therefore of great importance.

It is of special interest to study these conditions in respect of TV. In a viewing situation, attention has to be divided between picture and sound, which puts great demands on our ability. Sound and picture can disturb and counteract each other but they can also support and complement one another.

1) The study has been carried out with funds from the "Draft Committee on grants for Programming and Technical Research and Development".

METHODS

The experiment is designed around a TV news programme. For five of the news items the visual elements were varied systematically.

The programme was recorded in eight different variants, each exactly identical in all respects except the illustrations to five of the news items. Each programme variant was shown to a group of respondents, one group for each programme variant. In this way all groups could watch and hear the same news programme but five of the news inserts were illustrated in a different way. (See appendices 1, 2, 3 and 4.) Immediately after the transmission the respondents were asked to answer questions about what they could remember of the content of the message and describe their perception of the news items.

SOUND. News messages

The TV-programme is a simulated but realistic news programme which takes eight minutes and consists of 13 short news items with a length of 13-42 sec. The messages were read by an experienced studio reporter at normal reading speed. The news items which were recorded with different illustrations, had a length of 25-30 sec. and were of a general character, covering items which could occur every day. They had to be short enough to permit illustrations of stills but also long enough to contain information of the event, where it had happened, who or what was involved, causes and consequences. In other words enough information to be able to measure retention by means of relevant questions. (See appendices 1 and 2 with description of the news programmes and the messages.)

PICTURE. Illustration variants

The independent variable in the experiment was the visual information; i.e. the illustration which was presented together with a message. With assistance of so called evaluation panels, measurement of correspondence of a series of pictures with the content of a message was obtained.

From these correspondence measurements and from an analysis of the content of the illustrations in relation to the content of the messages, the illustrations were chosen.

For each of the five messages four illustrations with a different degree of correspondence and type were chosen. (See appendix 2 with description of the illustration for the different messages.)

<u>Degree of correspondence</u>	<u>Content of illustration</u>
A. very high	Map + text (place, event)
B. high	Picture of the object of the event
C. low	Picture of specific site + text (site)
D. low	Picture of the place's surroundings
E. ---	Studio reporter on the screen

Besides these five visual illustrations there was also a sound variant (F.) without picture.

One of the messages was accompanied by three moving visuals. These moving pictures are content-wise directly comparable with the illustration variants B, C and D for the same message. The stills are taken from the moving pictures.

Measurement of retention

The retention of the content of the verbal information was measured by means of multiple-choice questions. The subjects could choose between five alternatives, and they were instructed to put a cross in front of the alternative they thought was the right one. For each of the messages for which the illustrations varied, four questions were asked, for ex:

- | | |
|--|---------------|
| What kind of event was shown? | (Event) |
| Who or what was involved in the event? | (Object) |
| Where did it happen? | (Place) |
| What consequences had the event? | (Consequence) |

Besides the questions on the messages, for which the illustration varied, so-called control questions were put for another four messages.

Measurement of perception

The perception of the news items was measured by means of semantic scales. The subjects were asked to judge each news item (picture and sound together) on 11 scales with 7 positions, consisting of the following polar adjectives:

interesting - uninteresting
simple - complicated
exciting - boring
informative - empty
good - bad
important - unimportant
fascinating - indifferent
easy - difficult
detailed - concise
good illustration - bad illustration
the illustration facilitates the illustration makes it more difficult
the information - to perceive

The respondents

176 persons in the ages of 15-65 years, of both sexes and with varying educational backgrounds, participated in the investigation. The representation of those with a higher education and those with a lower education were about the same in each group. (See appendix 5).

Procedure

The TV programme was shown via two monitors to groups of respondents, one group for each programme variant. The participants had not been informed beforehand that they would answer questions on perception of the content of the programme, but they knew that they would be interviewed afterwards.

The experiment was carried out in the following steps:

Transmission of news programme	Measurement of retention	Transmission of separate news items	Measurement of perception
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The experiment took about 45 minutes. All participants were paid.

RESULTS

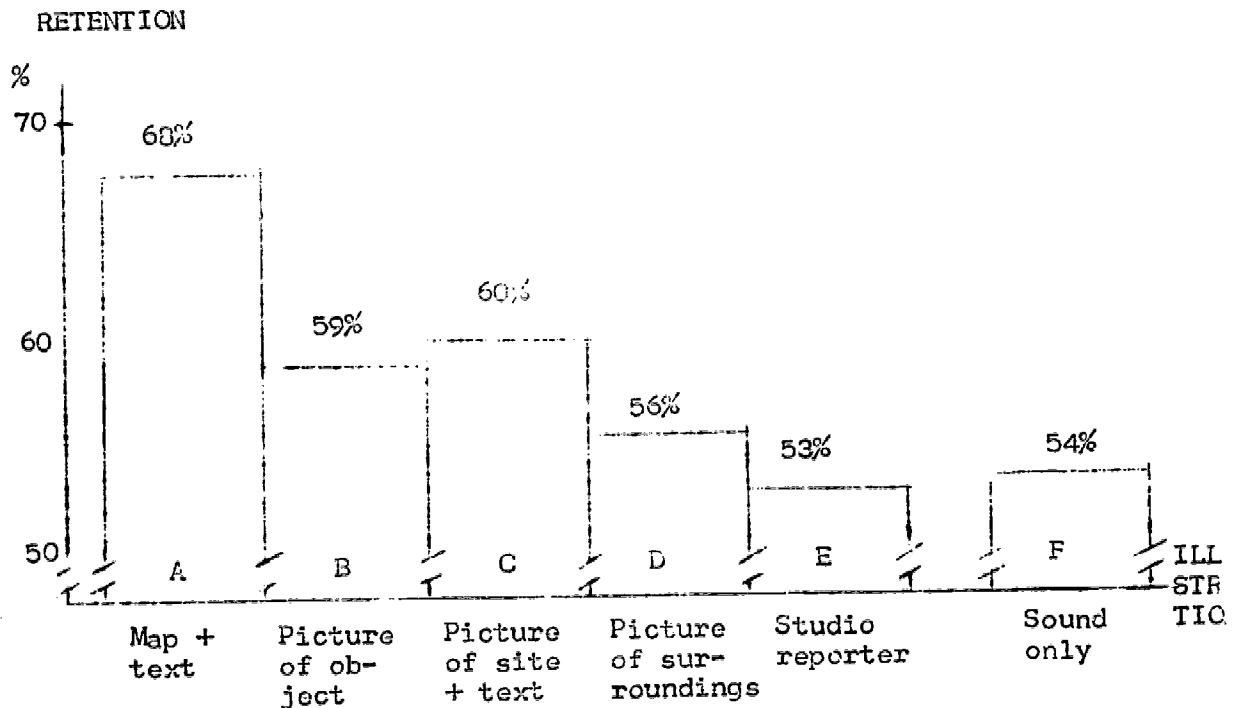
Comparison of visual variations

Retention, measured in the number of answered questions is tallied for each type of visual for all 5 news items.

1. for the whole message, that is for all four questions which were posed on each item;
2. for individual parts of the message, i.e. for each type of question.

1. Does the choice of visuals affect how much is remembered?

The diagram shows how the retention of a news item varies with the visual accompaniment. (The values in which the diagram is based are given in appendix 5.)



The diagram shows that retention of the spoken message varies with the visual accompaniment. The choice of illustration influenced how much the respondents remembered. The map gave the best retention; this illustration was also judged to have the highest correspondence with the spoken message. The respondents who retained the least were those who only saw the studio report and those who only were given the audio portion.

Around each value in the diagram is a certain error margin, which means that we cannot expound on the small difference between, for example, B and C, or between E and F. However, we can say that those who received the news item illustrated with a visual which highly corresponded with the audio portion, retained more of the story than those who were shown visuals with low correspondence. They also retained more than those who only saw the studio report or only heard the audio. (The spoken portion was composed for TV, so this is not a question of direct comparison between radio and TV).

The results shown in the diagram are tabulated from all the questions which were posed for each message. It says nothing about how retention was distributed on the different questions, for ex. if those who saw a certain illustration only remember a certain detail very clearly, or if they retain equally well all parts of the story. For this a detailed analysis is required for each individual question. The results of such an analysis are shown under item 2.

2. Does the choice of visual illustration affect what is remembered?

The table below shows how the retention of a certain message varies with the visual accompaniment.

QUESTIONS ON:						
	Degree of correspondence	Visual content	Event	Location	Object	Consequences
A	very high	Map + text	+	+	+	+
B	high	Picture of object	+	-	+	0
C	low	Picture of location + text	-	+	-	-
D	low	Picture of surrounding	0	-	-	0
E		Studio reporter	-	-	-	-
+ retention is <u>higher</u> than for the other visuals 0 retention is <u>average</u> - retention is <u>lower</u>						

(A further description of how retention of a certain message varies with visual accompaniment can be found in appendices 7 and 3).

Illustrations with high correspondence to the message tend to be better retained (plus-sign on the table) than those illustrations with low correspondence (minus-sign).

If we look at which visuals are better remembered on the different questions, we see that it is just that portion of the message which the visual illustrates that the respondents best remember, i.e. that content which the visual and audio have in common.

The map visual gives a better retention than the other visuals for all questions. The picture of the object in the story has a "plus" for questions on events and objects. The picture of the place where the story occurred with the place's name superimposed on the screen has a "plus" for question on location, but minus-sign on the other questions.

The diagram which shows how retention of the message varied with the visual accompaniment demonstrated that those respondents who saw illustration C remembered a relatively great deal of the story, in spite of the pictures low correspondence with the message. With the help of the analysis of individual questions, we can for the most part attribute the high retention to one single question. This would be the name of the place which the respondent remembers so well, while the retention of the other parts of the story are not equally as good. It is clearly the superimposed name of the place which contributed to the result.

A similar result also shows another item which was contained in the news programme. This concerned that item whose visual did not vary, but instead had control questions posed on it. The news item dealt with a high level conference in Moscow for East European communist leaders. The visual consisted of a view of Moscow with the title "Moscow" superimposed over it. 85% of those who saw the news item could correctly answer where the conference took place, 60% remembered who participated in the conference, and 17% could say what the conference was about. If we compare these figures with those from the group who only had the audio portion, we see that only 55% remembered the site of the conference, but on the other hand, 66% could remember who participated, and again, 17% remembered what the conference was about.

Merely measuring a visual's correspondence with a message is not sufficient to explain the results. If we wish to explain how the choice of illustration affects retention of a verbal message, it is not enough to simply measure the correspondence of the visual, but also to describe the visual's contents and analyze the relationship between the contents of the visual and the message.

3. Does the choice of visual affect the manner in which a news report is perceived?

The respondents were asked to judge each news item, picture and sound together, with help of semantic scales consisting of pairs of polar adjectives, such as important-unimportant. The following tabel shows in which respects the illustration differs from the mean value of the illustrations.

A.	Map + text (very high correspondence) + detailed, good illustration; illustration makes it easy to follow - uninterested
B.	Picture of object (high correspondence) + detailed; illustration makes it easy to follow. -
C.	Picture of location + text (low correspondence) + informative - poor visual
D.	Picture of surroundings (low correspondence) + - insignificant, poor, bothersome, inadequate illustration; illustration makes it difficult to follow
E.	Studio reporter on visual + simple - concise, poor illustration; illustration makes it difficult to follow
F.	Only audio + informative, important, good, detailed.

The news report was received most positively when they were illustrated with visuals of high correspondence as type A and B. Both of these illustrations were felt to be better than the others, and made the stories easier to follow.

The most negative results were obtained from illustration D. When the news report was illustrated with D, it was described as comparatively poor and insignificant.

Summary

Those respondents remembered the most for whom the news report was illustrated by a picture with high correspondence to the spoken message.

Those respondents who remembered the least were those who saw the studio reporter on camera or only received the audio portion.

The respondents remembered best those parts of the message which were illustrated or had a text superimposed on the visual that is to say that part of the message which the picture corresponds to.

The choice of illustration affected not only how much the respondents remembered of the news story, but also what in the message they remembered. Furthermore, the choice of illustration also affected the manner in which the news story was received.

Comparison between moving pictures and stills

This correlation is based on only one message. Three groups of the respondents saw the message illustrated by visual stills; one group with illustration of type B, one group with illustration of type C, and a third group with illustration of type D. Three other groups saw the news item illustrated by moving pictures of corresponding types. Otherwise all six groups saw the same news programme.

Retention

For two of the three groups no difference was noticed for the degree of retention between those who had watched the news item illustrated by moving pictures and those who had seen the message illustrated by a visual still.

In one case, with illustration D, the respondents who had seen the moving pictures, remembered more of the news item.

Audience reactions

Those news items which were illustrated by moving pictures were considered more interesting, more informative and better compared with the news items illustrated by a still. Furthermore the moving pictures themselves were considered to be a better illustration than the still.

The results from this limited comparison between moving pictures and stills show that the former give a more positive perception of the news item, but that there are no differences of retention which is directly connected to the movement of the picture itself.

Is there any correlation between sex, age, education and amount of retained information from the news programme?

The correspondents participating in the study were of both sexes, 15-65 years of age and with varying educational backgrounds.

Based upon how much is remembered from the news programme, measured in terms of right answers, the correlation between retention, sex, age, and education was studied.

Regarding the background variables of the respondents the following results were obtained:

SEX: On the average men remembered more than women.

AGE: On the average young people remembered more than middle-aged and elderly people, who in turn remembered about the same as the middle-aged people.

EDUCA- On the average the better educated remembered more than those with
TION: less education.

DISCUSSION

So far only a very few investigations have been carried out to study the interaction of sound and picture. This report is one of them, and it may be characterized as a first chart on the importance of visual illustration.

The study has not been designed to give an answer on how much a viewer remembers of the daily newscasts. The degree of retention is depended on, besides the facts in the news programme itself, what kind of questions, and in what way they are asked.

The experiment is designed to study the differences between varying illustrations on which the test programme is produced and the questions are formulated. The viewer situation, however, is somewhat more favourable than normal.

The experimental design has made possible a systematic variation of several different messages. The visuals have been analyzed according to type of illustration with the consequence that the results are not limited to only one message or a number of specific pictures.

A TV item consists of verbal and visual information simultaneously. The results from this study show that the picture does not function merely as a supplement to the spoken message but rather plays an important part in the TV item. If the picture is changed then the TV item itself is changed in many important respects.

If we are to summarize what we now know about how the picture functions, the results show that the choice of visual influences the retention of a news programme in the following three ways:

What items are remembered from a news programme?

The results from earlier studies show that TV items accompanied by visuals are to a greater extent remembered than pure audio messages. The pictures here function as some sort of "footholds" for the memory.

How much is remembered of the different news messages?

Illustrations with a high correspondence to the verbal message results in higher retention than those with a low correspondence, or with those with only the studio reporter on the screen.

The choice of illustration influences the attention and retention of the message so that different illustrations result in better or worse retention of the message.

Which parts of a news item does one remember?

That part of the message which is illustrated by a visual or what the text in the picture illustrates for the most part is better remembered than those parts of the message which the visuals do not illustrate.

Consequently the picture indicates and emphasizes certain things in the message and it is these parts of the programme which are then best remembered.

NEWS PROGRAMME

News items

1. Wildcat strike
2. Postal employees' congress
3. Car accident
4. Arsons
5. Burglary at post-office
6. Length of contract
7. Relocation grants
8. Hearing defects
9. Ship running aground
10. Warsaw Pact conference
11. Floods of Brazil
12. Released reporters
13. Riots in India

Illustration

1. Film: Striking workers
2. Still: Nils Hörjel
3. FIVE DIFFERENT ILLUSTRATIONS
4. Studio reporter
5. FIVE DIFFERENT ILLUSTRATIONS
6. Still: Åke Nilsson
7. FIVE DIFFERENT ILLUSTRATIONS
8. Studio reporter
9. FIVE DIFFERENT ILLUSTRATIONS
10. Moscow
11. FIVE DIFFERENT ILLUSTRATIONS
12. Studio reporter
13. Film: street demonstrations

Description of the five messages whose illustrations varied, and the different illustrations used.

NEWS ITEMS

Three youths were seriously injured today in an auto accident just south of Sundsvall. The trio were on their way to Sundsvall. In a slight right-hand curve they collided with a 33-ton petrol truck loaded with fuel. According to the Sundsvall police the private vehicle, as a result of its high speed swerved into the other lane and collided with the truck. The truck which was in the proper lane was unable to avoid the collision.

150.000 kronor in cash were stolen last night during a postal burglary in Uddevalla. The thieves were able to enter the post office with the help of a blow torch. The burglary was discovered around 5 a.m. when the postal employees arrived to begin the workday. The only clue which the thieves left behind was the blow torch.

Skoglund, Inc., a lumber supply company outside Piteå in Northern Sweden, has been granted an relocation grant by the government. The grant, 450.000 kronor, is to be invested in a new production center which will manufacture a construction plywood, a new building material which is used in pre-fab houses. At present the company has 30 employees, and it is estimated that this will be increased by another 60. Production is expected to be at full capacity in about one year.

ILLUSTRATION VARIANTS

(text in picture inside paranthesis)

A. Map of Sweden (Car accident, Sundsvall, Stockholm)

B. Wrecked auto

C. View of city (Sundsvall)

D. Highway entrance

E. Studio reporter.

A. Map of Sweden (Postal burgraly, Uddevalla, Göteborg)

B. Opened safe

C. View of town (Uddevalla)

D. Exterior of post office

E. Studio reporter.

A. Map of Sweden (relocation grant + 60 employees, Piteå)

B. Interior of lumber factory

C. Aerial view of town (Piteå)

D. Picture of forest being cleared

E. Studio reporter.

One of Siljarederiet's automobile ferries, the "Skandia", ran aground today in rough weather in Åland's southern archipelago. There were gale winds and low visibility at the time of the accident. The "Skandia" was on its way to Åbo with 11 cars and 42 passengers. Siljarederiet has emphasized that there is no danger for the passengers, and the ferry will be pulled free as soon as the weather permits. The weather forecast is favorable and the winds are expected to lie down within the next few hours.

A. Map of Sweden, Åland and Finland
(Ferry aground, Åland, Stockholm, Åbo).

B. Automobile ferry "Skandia"

C. View of the archipelago

D. Rough seas

E. Studio reporter.

Severe floods have struck the Recife region of northeastern Brazil. The floods have been attributed to the torrential rains of the last 2 days. Large areas of the town Recife have been destroyed and thus far there have been over 180 fatalities. Rescue crews are continuing the search for the missing, and one is worried that the total number of deaths will be higher.

A. Map of South America (Brazil, Recife, Rio de Janeiro, floods)

B. Flooded street with amphibious vehicle

C. View of town (Recife)

D. View of general area

D. Studio reporter.

APPENDIX III

Experimental design

The news programme was taped in 8 variations. Each variant was shown to a group of respondents. The only difference between the variants was the visual accompaniment to 5 of the 13 news items. The manner in which the visuals varied is shown in the following table:

NEWS PROGRAMME

Order of presentation of the news item	News items with visual variations	Visual variations								Only sound	
		STILLS					FILM				
		A	B	C	D	E	B	C	D		
1										9	
2										9	
3	I	1	4	3	2	5				9	
4										9	
5	II	4	2	1	5	3				9	
6										9	
7	III	5	3	2	1	4	6	7	8	9	
8										9	
9	IV	2	5	4	3	1				9	
10										9	
11	V	3	1	5	4	2				9	
12										9	
13										9	

I, II, III, IV, V: indicates the 5 items whose visual varied.

A, B, C, D, E: indicates the different visual variations.

1, 2, 3, 4, 5, 6, 7, 8, 9: indicates the different programme variations, and at the same time the groups which saw the respective programme variations.

Programme variant 6 is directly comparable with programme variant 3, programme variant 7 with 2, and 8 with 1, in all respects except the visual for item III, where programme variant 6, 7 and 8 have film illustrations, and 3, 2 and 1 have stills of corresponding contents (B, C and D).

EXAMPLE OF TWO OF THE EIGHT PROGRAMME VARIANTS.

Programme 1, i. e. the programme shown to group 1.

News item 1.

News item 2.

News item 3. MESSAGE I. Illustration of type A.

News item 4.

News item 5. MESSAGE II. Illustration of type C.

News item 6.

News item 7. MESSAGE III. Illustration of type D.

News item 8.

News item 9. MESSAGE IV. Illustration of type E.

News item 10.

News item 11. MESSAGE V. Illustration of type B.

News item 12.

News item 13.

Programme 2, i.e. which was shown to group 2.

News item 1.

News item 2.

News item 3. MESSAGE I. Illustration of type D

News item 4.

News item 5. MESSAGE II. Illustration of type B

News item 6.

News item 7. MESSAGE III, Illustration of type CC

News item 8.

News item 9. MESSAGE IV. Illustration of type A

News item 10.

News item 11. MESSAGE V. Illustration of type E

News item 12.

News item 13.

APPENDIX V

Table of the values upon which the diagram is based that shows retention varying with the visual accompaniment.

	Visual					Sound group
	A	B	C	D	E	F
Raw value						
Group's mean value n=16, max.: 64	47.6	42.8	43	41.6	39.6	38.9
Corrected for guessing						
Group's mean value n=16, max.: 64	43.7	37.7	38.7	35.9	34.1	34.5
Retention i % of maximum possible	60%	59%	60%	56%	53%	54%

Number of respondents per group:

Still visuals groups: Groups 1, 2, 3, 4, and 5 all had 15 resp.

Film groups: Group 7 had 16, group 8 had 23.

Sound Group: Group 9 had 29 respondents.

Background variables of respondents:

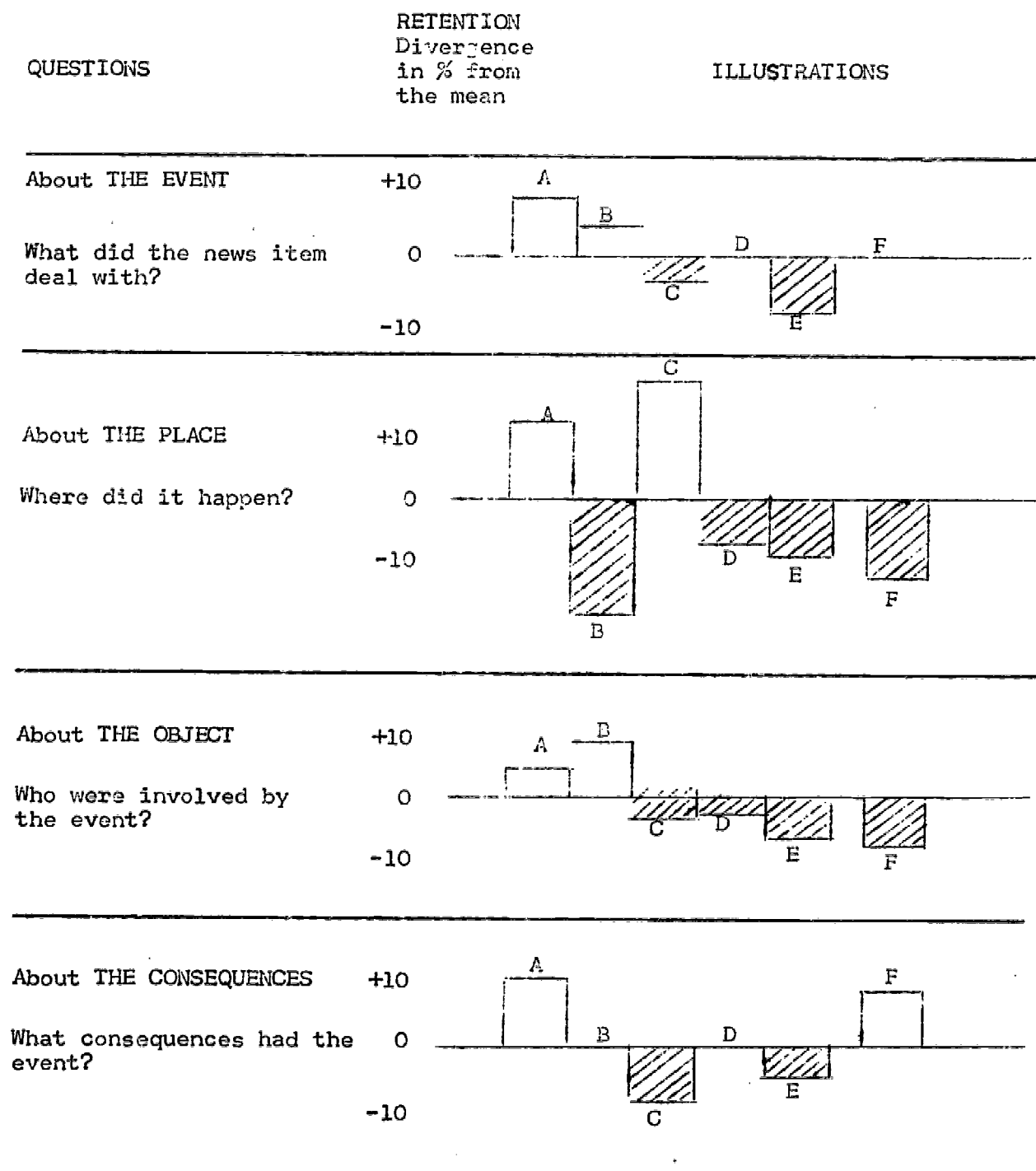
Sex: SEX		AGE			EDUCATION		
M	F	15-30	30-50	50-65	Primary school/ Comprehensive school	High school but no matriculation exam.	Matriculation exam or more
50%	50%	over 40%	over 30%	over 20%	30%	40%	30%

APPENDIX VI

Retention of a news item is measured with the help of 4 different types of questions: What type of occurrence was it that happened? Where did it take place? Who or what was affected by it? What were the consequences?

The tables in appendix 6 and 7 show the visual's effect on retention of the contents which were measured by the four different questions. The graphs show the divergence from the mean retention on the questions, as tabulated from all five messages and over all visuals.

Graphical description which shows the visual's effect on retention of different messages.



Graphical description which shows
the visual effect on retention
of different messages.

QUESTIONS ON

